

Influence of Silkworm Feeding Area and Nutrient Content on Cocoon Yield and Technological Properties

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Abstract: *For instance, when a farm doesn't have special worm-nurseries and mulberry plantations, this can influence negatively on silkworm rearing process. Nowadays, some silkworm breeders of particular farms are rearing the silkworm and producing cocoon in their own houses. The rooms for silkworm are small, even though the rooms are intended for a half box worms, instead of this, one box or one and half box worms are reared in these rooms. Accordingly, the feed is not provided to the worms in the norm that leads to different sizes of larva, decrease in their survivability, causes various diseases, decreasing of cocoon productivity and variety grade. In order to solve these problems positively, it is intended to carry out research works on the determination of the amount of silkworm according to ages of silkworm in feeding area and feeding dates, changes in feed amount given on this base, preventing diseases and eventually providing variety grade and productivity in accordance with fixed requirements, and to give appropriate suggestions for production. Therefore, when silkworm passes from age to age (instar), its body enlarges physiologically, accordingly it requires wider feeding area for obtaining normal nutrition. The provision of proper and wide feeding area is of crucial task of today in the cocoon production. If this practice is not performed properly, mulberry leaves are not provided to worms enough due to the imbalance of feeding area resulting improper feeding of silkworms and their difference sizes.*

Keywords: silkworm, feeding area, feed amount, caterpillar stage, survivability, worm breeding, raw cocoon, productivity, variety grade, mulberry leaves

1. Introduction

Along with other branches of agriculture, silkworm breeding is carried out in accordance with the achievements of modern science and technology, using advanced experience. Successful implementation of such huge tasks requires proper organization of work in the field of seed production, preparation of quality seeds, transition to generalized worm feeding, correct and timely resuscitation of silkworm seeds, full compliance with the rules of agrotomics and zoohygiene.

N.Akhmedov noted that feeding worms with mulberry leaves is an effective way to increase productivity [1]. The importance of the amount of nutrients in the manifestation of signs of productivity of mulberry silkworms has been noted [2, 3]

Due to the transformation of companies and other farms into farms in the country, there have been significant changes in the agricultural sector. In the field of silkworm breeding, there are important issues such as radical change of some processes, introduction of innovations, application of new technologies. For example, the lack of special worms on farms, the lack of mulberries, has a serious impact on the process of feeding worms. Nowadays, the cocoons breeders of the farms grow cocoons by feeding worms in the houses where they live. But while the worm-feeding rooms are small and half a box is designed to feed worms, they are fed one, one and a half, sometimes two boxes of worms instead of half a box. Accordingly, malnutrition also leads to worm infestation, reduced viability, disease, reduced cocoon productivity, and reduced fertility.

2. Materials and Methods

The study conducted in 2008-2010 at the Department of Sericulture and Mulberry growing Tashkent State Agrarian University and Buka district of Tashkent region. According to the program plan, the research carried out on a hybrid of silkworm Uzbekistan 5 × Uzbekistan 6, created by scientists of the Uzbek Silk Research Institute and used in agricultural production.

Determining the feeding area of 1, 2, 3, 4 variants in the experiment by age. The comparative variant is the increase in the total floor area (60 m²) for one box of worms by age (3.3% at the first stage larva (first moult or instar), 10% at the second stage larva, 25% at the third stage, 50% at the fourth stage and 100% at the fifth stage larva.

The worms in the experiment were fed according to the recommended agronomic rules for production. Worms infected and died during the feeding of worms are examined under a microscope in a special laboratory of the Department of Silk and the type of disease is determined.

All worms are fed on mulberry leaves growing on campus. The age of the worms is determined by the percentage of disease, the number of varietal, non-varietal and abnormal cocoons according to the cocoon variants, the average weight and silkiness of the shell of live cocoons (15 male and 15 female cocoons from each variant). At the end of feeding worms, the following indicators are determined.

3. Results and Discussion

According to leading silkworm experts and scientists, the

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effective absorption of food given to silkworms depends on the surface of the places on which they are placed. Worms are said to have the following levels depending on their age for growth and development to a certain extent: at 1st age - 2 sq. m. m; 2nd age - 5-6 sq. m. m; 3rd age - 12-15 sq. m. m; At the age of 4 - 25-30 sq. m. m; 5 age - 60 sq.m. m;

The new breed and hybrid silkworms created by scientists today differ from the old breeds in their viability, short worm feeding period, high survival rate, and good digestion of food. However, it has been stated in the above section that worm feeding has an adverse effect on agronomic practices, which is an important part of agronomic practices, and has led to low feed consumption. We see that our research on how this process affects the prolongation of the feeding period of worms has provided some important information of its own. These data are presented in Table 1 below.

Table 1: Influence of feeding area and amount of feed on silkworm feeding period (worm feeding period), days

Variants	1 st stage larva	2 nd stage larva	3 rd stage larva	4 th stage larva	5 th stage larva	Total period (days)
B ₁	4	4	5	9	12	34
B ₂	4	4	5	8	11	32
B ₃	4	4	5	7	9	29
B ₄	4	4	4	6.5	8	26.5
B ₅	4	4	4	5.5	7	24.5

The figures in Table 1 show that the duration of feeding of worms in the comparative variant (60 m² area) fed by the required level of agronomic rules is 24.5 days, the feeding period of worms fed in 50 m² area is 26.5 days, the duration of feeding worms in 40 m² area is 29 days, The feeding period of worms fed on 30 m² was extended to 31 days and that of worms fed on 20 m² was extended to 32 days. These figures show that as the feeding area decreases, the worms become thicker and smaller, and as a result, the worms begin to grow larger and smaller without being able to eat evenly.

Table 2: Influence of feeding area and amount of nutrients on cocoon yield

Variants	Number of worms in a box (19 grams), pcs	Total amount of cocoons, %	The average weight of a cocoon	The cocoon yield from a box of worms, kg
1	19 g (1- box)	60	1.38	37.3
2	19 g (1- box)	70	1.56	49.1
3	19 g (1- box)	74	1.74	57.9
4	19 g (1- box)	84	1.81	68.4
5	19 g (1- box)	92	1.88	77.8

The data in Table 2 show that a sharp decrease in the feeding area and the amount of feed given to the worm during the feeding period also led to a decrease in the total number of cocoons, the weight of 1 cocoon and the yield from 1 box of worms. For example, in the experimental variants, the total amount of cocoons decreases compared to the comparative variant (by 48-60%), and the weight of 1 cocoon decreases sharply (1.42-1.50 g). Therefore, in the comparative variant fed with a normal feeding area and the required level of feed, 73.7 kg of worms were obtained from 1 box of worms, this figure is 62.7 kg when the worms are fed on 50 m², 52.2 kg when fed on 40 m², 40.5 kg when fed on 30 m² and 30.7 kg when fed on 20 m². This means that the feeding area is

less than the norm, which reduces the cocoon yield from 1 box of worms to 34-44 kg.

4. Conclusions

Based on the data obtained in the study, the effect of silkworm feeding area and nutrient content on cocoon yield and variety was determined:

- For a silkworm to develop evenly, it must have a certain amount of standard area for each age, and this area must be organized according to the number of worms.
- The smaller the feeding area, the lower the amount of leaves given to the worms. In other words, if we take the worm rate (60 m²) and the nutrient content as 100%, the worms in 50 m² consume 82%, the worms in 40 m² consume 68%, the worms in 30 m² consume 50%, and the worms in 20 m² consume 32% of the leaves.
- The duration of feeding of worms fed in the comparative variant (60 m² area) fed by the required level of agrotechnical rules is 24.5 days, feeding period of worms fed on 50 m² area is 26.5 days, feeding period of worms fed on 40 m² area is 29 days, feeding period of 30 m² area duration was 32 days and the feeding period of worms fed on 20 m² was extended to 34 days.
- When feeding adult worms, the feeding area is less than the norm (20, 30, 40 m²), which leads to bacterial (mainly hemorrhagic and plague) diseases of worms.
- Inadequate feeding of worms has a negative impact on the technological characteristics of the cocoons, which in the experimental variants leads to a reduction in the metric number of silk fibers by 8.13%, continuous spinning length by 23.2%, silk yield by 10.8%.

References

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